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June 30, 2000

Ms. Runore C. Wycoff, Director
Environmental Restoration Division
U.S. Department of Energy
Nevada Operations Office
P.O. Box 98518
Las Vegas, Nevada 89193-8518

RE: NDEP Review of: Corrective Action Investigation Plan for Corrective Action Units 97 and 100: Yucca Flat and Climax Mine, Nevada Test Site, Draft, Revision No.: 0, March 2000

Dear Ms. Wycoff:

The Nevada Division of Environmental Protection (NDEP) has reviewed the document entitled Corrective Action Investigation Plan for Corrective Action Units 97 and 100: Yucca Flat and Climax Mine, Nevada Test Site, Draft, Revision No. 0, March 2000 (YF/CM CAIP). Since this document is a preliminary draft, it is not subject to either approval or disapproval. The comments below are provided to indicate changes in the draft that would support approval of a final document.

The comments and guidance provided herein have been developed in the context of the overall Underground Test Area Subproject (UGTA) Program. DOE is expected to apply lessons learned from the comments provided from any preliminary or final drafts of the UGTA Corrective Action Investigation Plans (CAIP) and from any Corrective Action Unit (CAU) to each subsequent CAIP. Therefore, comments previously provided regarding CAIPs for other Corrective Action Units (CAUs), and not addressed in the document, are considered applicable in this review.

General Programmatic Comment - Mis-statements of the Content and Legal/Technical Implications of the FFACO are Unacceptable

On p. 1, it is stated "Based on the general definition of a CAI from Section IV.14 of the FFACO, the purpose of the CAI is "*...to gather data sufficient to characterize the nature, extent, and rate of migration or potential rate of migration from releases of discharges of pollutants or contaminants and/or potential releases or discharges from corrective action units identified at the facilities...*"" (FFACO, 1996). However, for the UGTA CAUs, "*...the objective of the CAI process is to define boundaries around each UGTA CAU that establish areas that contain water that may be unsafe for domestic and municipal use...*" as stated in Appendix VI of the FFACO (1996).

The implication in the above statement, is that the provisions of the body of the FFACO do not apply to the UGTA process, is entirely incorrect. In fact, the provisions of Appendix VI of the FFACO are entirely consistent with those of the body of the FFACO and subordinate to the provisions in the body of the FFACO in case of any perceived lack of agreement between the two. DOE is reminded that Subpart V of the FFACO explicitly states "*Appendices I-VI are incorporated by reference into this Agreement. Any ambiguity resulting from different language used in an appendix versus the body of this Agreement shall be resolved in favor of terms and conditions found in the body of this Agreement."*

Evaluation of Data Needs and the Conceptual Model

NDEP has already provided DOE with comments regarding this CAIP in a letter dated June 9, 2000 (Liebendorfer to Wycoff). The fundamental point made in that letter concerned the lack of clarity in the CAIP and what specific data were available and utilized during the development of the Conceptual Model. In order to remedy this deficiency, a revised conceptual model must be developed and submitted.

General Comment No. 1 - Data Collection Plans Need to Include Specific Drilling Activities to Address Identified Data Deficiencies

Section **6.0 Field Activities** provides plans for the collection of additional data. However, NDEP finds these planned field activities do not adequately address deficiencies in existing data. NDEP anticipates that a more fully developed YF/CM CAIP must be prepared, that it must more clearly identify additional data deficiencies, and it must propose effective data collection strategies. This revised data collection effort must be based upon the required

revisions to the conceptual model, as discussed above. Furthermore, data collection plans submitted as part of a revised YF/CM CAIP must consider how the new data will either supplement existing data and support the revised conceptual model, or disprove conceptualizations of groundwater flow and contaminant transport and allow for new interpretations of the hydrogeology.

NDEP anticipates that a single iteration of data collection and analysis, as proposed in a revised YF/CM CAIP, may not be sufficient to fully address questions of data deficiency. Further proposals delineating additional data collection activities may need to be transmitted to NDEP as addenda to the YF/CM CAIP. These subsequent data collection proposals would correspond to the data collection loop identified in the recently agreed-to, revised flow chart for UGTA investigations (see attached chart).

NDEP is not suggesting the number or exact locations of wells necessary to address data deficiencies during this first iteration of data collection, pursuant to the revised UGTA flow chart. However, the revised CAIP must include proposed locations and depths of wells to be drilled, as well as specific proposals for concomitant data collection and analysis.

The revised CAIP must have provisions for measuring hydrologic parameters. Included should be, but not necessarily limited to, the following parameters: hydraulic conductivity; diffusivity and dispersivity; hydraulic head and gradient for each geologic unit identified below the water table; and the contaminants, specifically including the specific radionuclide species and activity levels for those radionuclide species; and the current rates and directions of movement for the contaminants of concern in the groundwater.

Examples of two areas which NDEP sees as needing more information are:

a) the hydrogeologic relationship between the Climax Mine area and the northern portion of Yucca Flat, and;

b) conditions in the lower carbonate aquifer.

In addition to basic hydrologic parameters, the cross-fault correlation of hydrostratigraphic units (if any), vertical gradients, and presence of barriers to flow or conduits for enhanced flow are all issues requiring further investigation. Specific proposals for data collection in this regard must be included in the final YF/CM CAIP.

Also, a review of the most recent copy of the document entitled Project Execution Plan, Revision No.: 1, Environmental Restoration Life-Cycle Baseline, Revision No.: 2, May 2000 (Baseline Document), made available to NDEP indicates the funding proposed to be allocated to data collection tasks is totally inadequate to remedy the identified data deficiencies. In accordance with the requirements of the FFACO, it is the responsibility of DOE to seek the funding needed to perform the work in order to satisfy regulatory requirements indicated by NDEP.

General Comment No. 2 -Predictive Modeling Required to Comply with 10-Step Method for Model Validation

Step 7 of the 10-Step Method for Model Validation, previously submitted to DOE, requires that the representativeness and uniqueness of the model needs to be tested against an independent set of site-specific data. Specific predictions of the respective distributions and concentrations of particular contaminant species in the groundwater, at specified locations in the CAU sub-area being investigated, need to be made using the model. Then, these predictions need to be tested against data from those locations (i.e.; either existing data not used in the construction and pre-prediction testing of the model, or new data derived from drilling and sampling the groundwater at those locations).

If model predictions do not match the observed pollutant/contaminant species and concentrations to within a range of uncertainty as agreed to by NDEP, then further data collection and model development will be required prior to the next attempt to satisfy step 7 of the 10-Step Model Validation process.

As noted above, proposed plan(s) for this additional data collection will need to be submitted to NDEP as Addenda to the YF/CM CAIP. Also, this iterative testing and data collection/model development process is in accordance with the draft flow chart agreed to by DOE and NDEP. Model Validation is required to be completed successfully prior to the prediction of contaminant boundaries.

General Comment No. 3 - Proposed Investigation/Modeling Area Unacceptably Large

NDEP is concerned that the proposed Investigation and Potential Model Area, as presented in Figure 1-2, is unnecessarily large. NDEP recognizes that the outlined area is intentionally large in order to include all possible pathways and to ensure that the CAU

computer model is in agreement with the regional flow system. Certainly, if preliminary calculations were to show contaminant movements at this scale within the 1000-year simulation time frame, a large model area would be appropriate. However, NDEP contends that the investigation must proceed toward a more-focused, CAU-specific understanding of flow and transport. The contamination is in the area of the test cavities in Yucca Flat and the hydrogeologic features most likely to influence contaminant migration in the short term are also in Yucca Flat. For this investigation to adequately address questions of radionuclide transport in the Yucca Flat and Climax Mine area, it is only reasonable to expect that a truly CAU-specific field investigation and numerical modeling effort be undertaken.

General Comment No. 4 - Use of Sub Areas

The analysis proposed in the draft CAIP deals strictly with the CAU as a single large area. NDEP believes that some consideration must be given to an approach which splits the CAU into sub-CAU areas for analysis. This would allow for more detailed analysis at a smaller scale and thereby break the problem into more manageable portions. This may allow for some of the predictive evaluations that will be needed in order to validate the larger-scale predictive model.

This concludes the statement of General Comments.

If DOE should wish to meet with NDEP prior to the submission of the final YF/CM CAIP, NDEP will be pleased to review work in progress and provide comments and guidance as indicated. Such comments and guidance could include, but not be limited to

a) reduction of existing data
b) preliminary modeling
c) completeness and suitability of final YF/CM CAIP

If DOE cannot provide an acceptable Conceptual Model as discussed above, the result will very likely be a finding of Substantial Deficiency for the YF/CM CAIP pursuant to Subpart VIII.3.b of the FFACO.

Questions regarding this matter may be addressed to S. Jaunarajs at (775) 687-4670 Ex. 3030, C. Goewert at (702) 486-2865, C. Case at (775) 687-4670 Ex. 3029, or me at (775) 687-4670 Ex. 3039.

Sincerely,

Paul J. Liebendorfer, P.E.
Chief
Bureau of Federal Facilities

PJL/SJ/CJG/CC/js
Enclosure

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